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STANDARDIZED THEME HANDLING FOR DIGITAL TELEVISION

The invention relates generally to digital television communications and, more particularly, to a technique for providing standardized themes, e.g., genres, for programs.

Digital television communications have become increasingly popular due to the quality of the audio and video signals and the various features that can be realized. For example, standards defined by the Digital Video Broadcasting (DVB) consortium have been implemented in many parts of the world. Among other things, these standards include a series of transmission specifications, including DVB-S, a satellite transmission standard, DVB-C, a cable delivery standard, and DVB-T, a terrestrial transmission standard. DVB-T is a sophisticated and flexible digital terrestrial transmission system that is based on COFDM (Coded Orthogonal Frequency Divisional Multiplexing) and QPSK, 16 QAM and 64 QAM modulation. DVB-T allows services providers to match, and even improve on, analogue coverage, at a fraction of the power. Moreover, it extends the scope of digital terrestrial television in the mobile field, such as to portable hand-held devices.

Digital television transmissions include theme assignments, also known as genre assignments, for the different programs carried in the transmissions. The genres describe a category in which a program is placed, e.g., to assist the user in selecting a program or blocking a program. For example, genres include movies, news, sports, children's programs, and the like. However, a problem arises in that a receiver must be configured for the specific genre assignment scheme of the transmissions it receives. Costs are increased since receivers with different configurations must be maintained and deployed, e.g., in different countries. For example, for DVB-T receivers in Europe, there is the problem that D-book and E-book genres do not agree. Moreover, Spain has introduced its own set of genres based on the E-book with extensions.

Accordingly, it would be desirable to provide a method and apparatus for addressing the above and other issues.

In a particular aspect of the invention, a method provides standardized genre assignments. The method includes receiving at least a first digital data transmission, wherein at least one program in the first digital data transmission is associated with a genre

according to a first genre assignment schedule, identifying a jurisdiction associated with the first genre assignment schedule, obtaining data from the first digital data transmission that identifies the associated genre, and mapping the at least one program to a genre in a standardized genre assignment schedule according to the associated identified jurisdiction
5 and the associated identified genre.

A related receiver and program storage device are also provided.

In the drawings:

Fig. 1 illustrates an example receiver for providing genre assignments, according to the invention; and

10 Fig. 2 illustrates a method for providing genre assignments, according to the invention.

In all the Figures, corresponding parts are referenced by the same reference numerals.

15 Fig. 1 illustrates an example receiver for providing genre assignments according to the invention. Block 102 is a “tuner and decoder.” Block 103 is “control circuitry.” Block 113 is a “memory”. Block 104 is a “genre data” memory. Block 105 is a “country/region setting” memory. Block 107 is “output circuitry”. Block 106 is a “user interface.” Block 110 is a “display”.

20 The receiver 100 receives one or more digital television transmissions from one or more respective transmitters. For example, a transmission may be received that is associated with the same country in which the receiver 100 is located. The user may provide a country and/or region setting for the receiver, which does not necessarily have to correspond with the actual location of the receiver. The receiver 100 may be essentially any suitable data receiver, including Digital Home Equipment, e.g., a digital TV, an interactive digital TV (iDTV) set-top box (STB), personal video recorder (PVR), Digital Audio, or DVD. The receiver may further include a mobile receiver such as a PDA or mobile phone.

25 In accordance with the invention, the genre assignment data from the received transmission is mapped to a standardized genre assignment. In the DVB system, the genre assignment data for each program is denoted by the term content_descriptor, as discussed in further detail below. However, the invention is suitable for use with other digital data transmission schemes. The transmissions from different countries or other jurisdictions

can have different content descriptor data. The jurisdiction can be a country, group of countries, portion of a country, a region such as Europe, a city, and so forth.

Advantageously, the receiver 100 can be provided in any location, where it reads the original genre assignment data of the received transmission that is provided by the broadcaster, and maps it to a standardized genre assignment schedule. The invention obviates the need for country-specific receivers.

In one possible approach, the invention is implemented using components within a television set-top box receiver, e.g., receiver 100 that receives a television signal via an input path 101, such as an antenna, and outputs a signal for display on a display device 110 such as a television via signal output path 108. However, the invention is generally applicable to any type of device that receives video and/or audio programs. For example, the invention may be implemented in a computer that receives video programs from a network such as the Internet, e.g., by downloading, streaming or broadcasting, such as webcasting. The video programs typically include an audio track although this is not required. Moreover, the invention can be used with audio-only programs such as those provided via the Internet, e.g., as webcasts, or via radio broadcasts, including terrestrial and satellite radio broadcasts.

The receiver 100 tunes, demultiplexes and decodes the received programs at a tuner/decoder 102. The genre assignment data carried in the received transmission is also tuned, decoded and recovered by the tuner/demultiplexer/decoder 102 and provided to control circuitry 103. The programs may be provided in a digital or analog multiplex that is transmitted by cable, satellite, or terrestrial broadcast, for example. Generally, one of the programs is decoded based on a channel selection made by the user/viewer via a handheld remote control. A user input signal from the remote control is processed by a user interface function 106 in the receiver 100. The remote control may use any type of communication path 109, such as infrared, wired, ultrasound, radio frequency, etc. When the user selects a channel via the user interface 106, the control circuitry 103 recovers the corresponding program, e.g., using information such as packet identifiers (PIDs), from the received transmission.

The decoded program may be communicated to the display device 110 via output circuitry 107 or stored locally for subsequent display. Control circuitry 103, such as a microprocessor with a working memory 113, may interact with the tuner/decoder 102 to

control the functions of the tuner/decoder 102. The working memory 113 may be considered a program storage device that stores software that is executed by the control circuitry 103 to achieve the functionality described herein. However, resources for storing and processing instructions such as software to achieve the desired functionality may be provided using any known techniques.

The control circuitry 103 stores the genre assignment data in a genre data memory 104. A country and/or region setting may be stored in a memory 105 for use by the control circuitry 103 in its decision-making processes. The memories 103 and 105 are shown as being separate but may be combined with other memory resources. The country and region setting may be provided by the user via the user interface 106, or set by a hardware configuration, e.g., switch, at the receiver, such as at the time of manufacture or installation.

In some cases, the genres of the standardized genre assignment schedule are the same as the original genre assignments. For example, the original genre of "sports" in a received transmission may be mapped to the standardized genre of "sports". In other cases, multiple genres can be mapped to a single genre. For example, genres of "baseball" and "football" can both be mapped to the genre of "sports". The standardized genre assignments may be used to assist the user in locating a program. For example, an on-screen program guide may list the programs according to the standardized genre assignments. Moreover, a blocking feature may use the standardized genre assignments so that programs associated with a particular genre are blocked from viewing.

The invention provides standardized genre assignments that allow one receiver to be used all over Europe or other region where diverse genre assignments schemes are used. As mentioned, for DVB-T receivers in Europe, genre handling is a problem since D-book and E-book do not agree. Spain introduced its own set of genres, based on E-book with extensions. The D-Book is a shorthand reference to the "Requirements for interoperability for UK Digital Terrestrial Television D-Book", provided by the Digital Television Group (DTG). The text contains details for implementing the DVB standards, and has been adopted in the UK. The E-book refers to a related standard that has been adopted in Europe.

The following is a summary of the tables provided herein:

Table 1 - Overview of genre assignments for different countries

- Table 2 - standardized genre assignments (invention)
- Table 3 - E-book content descriptors
- Table 4 - E-book genre assignments
- Table 5 - Spain genre assignments
- 5 Table 6 - Australia genre assignments
- Table 7 - UK D-book genre assignments
- Table 8 - Finland genre assignments
- Table 9 - Sweden genre assignments
- Table 10 – illustrates a content description behavior
- 10 An overview of the genre assignment schedules or tables for E-book, Spain, Australia, GBR D-book, and Sweden is provided in Table 1. The first column of the table indicates the standard content nibble. A nibble is a half-byte of data. This is data in the received transmission that associates a genre with a program. Note that the following abbreviations may be used herein: ESP - Spain, UK - United Kingdom, GBR – Great Britain, AUS – Australia, SWE – Sweden.
- 15

Table 1 – Overview of genre assignments for different countries

Nib ble	E-book	ESP	AUS	GBR D-book	SWE
0x0	Undefined	Sin definir (undefined)	Undefined	Unclassified	Odefinierat (unclassified)
0x1	Movie/Drama	Cine (cinema)	Movie	Movie	Film (movie)
0x2	News/Current affairs	Informativo (informative)	News	News and Factual	Nyheter (news/current affairs)
0x3	Show/Game show	Entertainment (entertainment)	Entertainment	Entertain- ment	Nöje (entertain- ment)
0x4	Sports	Deporte (sports)	Sport	Sport	Sport
0x5	Children's / Youth programmes	Infantil (infantile)	Children's	Children's	Barn (children's/ youth)
0x6	Music / Ballet / Dance	Música (music)	Music	Entertain- ment	Musik (music)
0x7	Arts / Culture without music	Documental (documentary)	Arts/Culture	News and Factual	Kultur (culture without

					music)
0x8	Social / Political issues / Economics	Magazine	Current affairs	News and Factual	Politik (Social / Political issues / Economics)
0x9	Children's Youth: Education / Science / Factual topics	Televentas (tele-sales)	Education / information	Education	Utbildning (education / science)
0xA	Leisure hobbies	Ocio (leisure)	Infotainment	Lifestyle	Fritid (leisure hobbies)
0xB	Special Characteristics	Toros (bulls)	Special		
0xC	Reserved	Serie (series)	Comedy		
0xD	Reserved	Adulto (adult)	Drama		
0xE	Reserved	Religion	Documentary		
0xF	User defined			Drama	

The invention provides an example standardized genre assignment schedule in Table 2 that resolves the mix of the genre assignments for the different countries/regions. The schedule uses E-book as starting point (Table 4), and adds nibbles 0xB through 0xE according to the Spanish definition (Table 5), and nibble 0xF according to the UK D-book definition (Table 7). A separate solution can be created for Australia, both for parental control and content description. New icons might be added for Toros (bullfighting), Adulito (adult), and Religion. Moreover, one can use "movie" for serie, comedy and drama. One can also use "educational" for documentary. Generally, the themes can be associated with small icons.

For the genre assignments in Spain (Table 5), the receiver 100 processes the genre assignment data by interpreting the user-nibbles first. If the user-nibbles are set to 0x0 (undefined), then the standard content nibbles are interpreted. All other countries interpret the standard content nibbles, mapping them to standardized genre assignments such as the example assignments shown in Table 2. Table 2 is used when interpreting only level1. According to the Home Audio Video Interoperability (HAVi) consortium, a level1 user interface uses a data driven interaction for the intermediate AV Device (IAV). A level 2 user interface uses Java for the more advanced full AV device (FAV).

Note that the use of one or more nibbles to map a program to a standardized genre is an example only, as many variations are possible.

Table 2 – Standardized Genre Assignments

Nibble:	Genre:
0x00	Undefined
0x01	Movie/Drama
0x02	News/Current affairs
0x03	Show/Game show
0x04	Sports
0x05	Children's / Youth programs
0x06	Music / Ballet / Dance
0x07	Arts / Culture without music
0x08	Social / Political issues / Economics
0x09	Education / Science / Factual topics
0x0A	Leisure / Hobbies
0x0B	Bullfighting (ESP)
0x0C	Series (ESP)
0x0D	Adult (ESP)
0x0E	Religion (ESP)
0x0F	Drama (UK)

5

The genres 0x0B through 0x0F have a code attached to indicate the country they come from. Under normal circumstances these genres will only be used in the respective countries.

Table 3 provides the syntax of the E-book content descriptors. The version of the 10 E-book / EN 300 468 standard used is discussed in EACEM Technical Report, Number TR-030 version 1.1, 7 April 2000, and ETSE EN 300 468 v1.4.1, November 2000, respectively. The recommended descriptor is as defined in EN 300 468. The intention of the content descriptor is to provide classification information for an event.

The content_descriptor() includes a total of four nibbles (two DVB, two USER). 15 Such a combination of two nibbles allows for 2 levels of user interfaces: a level 1 interface that only uses the first nibble, and a level 2 interface using the second nibble, allowing an extra subdivision per given theme or genre.

Table 3 – E-book Content Descriptor

Syntax	No. of bits	Identifier
content_descriptor(){		
descriptor_tag	8	uimsbf
descriptor_length	8	uimsbf
for (i=0;i<N;i++) {		
content_nibble_level_1	4	uimsbf
content_nibble_level_2	4	uimsbf
user_nibble	4	uimsbf
user_nibble	4	uimsbf
}		
}		

The semantics of the content descriptors are as follows.

- content_nibble_level_1: This 4-bit field represents the first level of a (standard)
5 content identifier. This field should be coded according to Table 4.
- content_nibble_level_2: This 4-bit field represents the second level of a (standard)
content identifier. This field should be coded according to Table 4.
- user_nibble: This 4-bit field is defined by the broadcaster.
- Table 4 provides example E-book genre assignments and, more specifically, genre
10 assignments for Content_nibble levels 1 and 2.

Table 4 - E-book genre assignments

Content_nibble_level_1	Content_nibble_level_2	Description
0x0	0x0 to 0xF	undefined content
Movie/Drama:		Movie/Drama:
0x1	0x0	movie/drama (general)
0x1	0x1	detective/thriller
0x1	0x2	adventure/western/war
0x1	0x3	science fiction/fantasy/horror
0x1	0x4	comedy
0x1	0x5	soap/melodrama/folkloric
0x1	0x6	romance
0x1	0x7	serious/classical/religious/historical movie/drama
0x1	0x8	adult movie/drama
0x1	0x9	to 0xE reserved for future use
0x1	0xF	user defined

Content_nibble_level_1	Content_nibble_level_2	Description
News/Current affairs:		News/Current affairs:
0x2	0x0	news/current affairs (general)
0x2	0x1	news/weather report
0x2	0x2	news magazine
0x2	0x3	documentary
0x2	0x4	discussion/interview/debate
0x2	0x5	to 0xE reserved for future use
0x2	0xF	user defined
Show/Game show:		Show/Game show:
0x3	0x0	show/game show (general)
0x3	0x1	game show/quiz/contest
0x3	0x2	variety show
0x3	0x3	talk show
0x3	0x4 to 0xE	reserved for future use
0x3	0xF	user defined - ETSI
Sports:		Sports:
0x4	0x0	sports (general)
0x4	0x1	special events (Olympic Games, World Cup etc.)
0x4	0x2	sports magazines
0x4	0x3	football/soccer
0x4	0x4	tennis/squash
0x4	0x5	team sports (excluding football)
0x4	0x6	athletics
0x4	0x7	motor sport
0x4	0x8	water sport
0x4	0x9	winter sports
0x4	0xA	equestrian
0x4	0xB	martial sports
0x4	0xC to 0xE	reserved for future use
0x4	0xF	user defined
Children's/Youth programs:		Children's/Youth programs:
0x5	0x0	children's/youth programs (general)
0x5	0x1	pre-school children's programs
0x5	0x2	entertainment programs for 6 to 14
0x5	0x3	entertainment programs for 10 to 16
0x5	0x4	informational/educational/school programs
0x5	0x5	cartoons/puppets
0x5	0x6 to 0xE	reserved for future use
0x5	0xF	user defined
Music/Ballet/Dance:		Music/Ballet/Dance:
0x6	0x0	music/ballet/dance (general)

Content_nibble_level_1	Content_nibble_level_2	Description
0x6	0x1	rock/pop
0x6	0x2	serious music/classical music
0x6	0x3	folk/traditional music
0x6	0x4	jazz
0x6	0x5	musical/opera
0x6	0x6	ballet
0x6	0x7 to 0xE	reserved for future use
0x6	0xF	user defined
Arts/Culture without music):		Arts/Culture (without music):
0x7	0x0	arts/culture (without music, general)
0x7	0x1	performing arts
0x7	0x2	fine arts
0x7	0x3	religion
0x7	0x4	popular culture/traditional arts
0x7	0x5	literature
0x7	0x6	film/cinema
0x7	0x7	experimental film/video
0x7	0x8	broadcasting/press
0x7	0x9	new media
0x7	0xA	arts/culture magazines
0x7	0xB	fashion
0x7	0xC to 0xE	reserved for future use
0x7	0xF	user defined
Social/Political issues/Economics:		Social/Political issues/Economics:
0x8	0x0	social/political issues/economics (general)
0x8	0x1	magazines/reports/documentary
0x8	0x2	economics/social advisory
0x8	0x3	remarkable people
0x8	0x4 to 0xE	reserved for future use
0x8	0xF	user defined
Children's/Youth programs:		Children's/Youth programs:
Education/ Science/Factual topics:		Education/ Science/Factual topics:
0x9	0x0	education/science/factual topics (general)
0x9	0x1	nature/animals/environment
0x9	0x2	technology/natural sciences
0x9	0x3	medicine/physiology/psychology
0x9	0x4	foreign countries/expeditions
0x9	0x5	social/spiritual sciences
0x9	0x6	further education

Content_nibble_level_1	Content_nibble_level_2	Description
0x9	0x7	languages
0x9	0x8 to 0xE	reserved for future use
0x9	0xF	user defined
Leisure hobbies:		Leisure hobbies:
0xA	0x0	leisure hobbies (general)
0xA	0x1	tourism/travel
0xA	0x2	handicraft
0xA	0x3	motoring
0xA	0x4	fitness & health
0xA	0x5	cooking
0xA	0x6	advertisement/shopping
0xA	0x7	gardening
0xA	0x8 to 0xE	reserved for future use
0xA	0xF	user defined
0xB	0x0	original language
0xB	0x1	black & white
0xB	0x2	unpublished
0xB	0x3	live broadcast
0xB	0x4 to 0xE	reserved for future use
0xB	0xF	user defined
0xC to 0xE	0x0 to 0xF	reserved for future use
0xF	0x0 to 0xF	user defined

Table 5 provides genre assignments for Spain. The content nibble definition provided by DVB does not cover all the usual events broadcasted in Spain. For example, there is no appropriate content nibble for "Toros" or bullfighting (nibble 0xB). Moreover, some content nibbles are too specific. For example, there is a unique content nibble to describe western, adventure and war events. See level 2 nibbles 0xB, 0xC, and 0xD, respectively, under level 1 nibble 0x1. To provide a description that better matches the values needed in Spain, broadcasters and receivers are recommended to use user nibble values defined in Table 5.

Broadcasters should still send the content nibble as defined in DVB, regardless if they are sending user nibble for that event. Receivers following this specification should use the user nibble value instead of the content nibble when it is present. If no user nibble is present, the content nibble will be used. Broadcasters should avoid using other values than as defined since they will not have a meaning for receivers following the present scheme.

Table 5 - Spain genre assignments

User nibble level 1	Description	User nibble level 2	Description
0x0	Sin definir	0x0 to 0xF	Sin definir (undefined)
0x1	Cine (cinema)	0x0	general
		0x1	suspense
		0x2	Acción (action)
		0x3	ciencia-ficción (science fiction)
		0x4	Comedia (comedy)
		0x5	drama
		0x6	Romántico (romantic)
		0x7	Histórico (historic)
		0x8	Erótico (erotic)
		0x9	Musical
		0xA	Policiaco (police)
		0xB	Vaqueros (Western)
		0xC	Aventuras (adventure)
		0xD	Bélico (war)
		0xE	Infantil (children)
		0xF	experimental
0x2	Informativo (informative)	0x0	general
		0x1	el tiempo (weather)
		0x2	Actualidad (current events)
		0x3	Diario (newspaper)
		0x4	Debate
		0x5	Económico (economic)
		0x6 to 0xF	
0x3	Entretenimiento (entertainment)	0x0	General
		0x1	Concurso (contest)
		0x2	Variedades (variety)
		0x3	Entrevistas (interviews)
		0x4	Ofertas (promotions)
		0x5	Debate
		0x6	Espectáculos (spectacles)
		0x7	Divulgativos (divulging)
		0x8	Teatro (theatre)

		0x9 to 0xF	
0x4	Deporte (sports)	0x0	General
		0x1	evento especial (special events)
		0x2	Informativo (informative)
		0x3	Fútbol (soccer)
		0x4	Tenis (tennis)
		0x5	Atletismo (athletics)
		0x6	Motor (automotive)
		0x7	Acuáticos (aquatics)
		0x8	de invierno (winter sports)
		0x9	equitación (equestrian)
		0xA	artes marciales (martial arts)
		0xB	Baloncesto (basketball)
		0xC	golf
		0xD	Ciclismo (cycling)
		0xE	Naútico (boating)
		0xF	
0x5	Infantil (children's)	0x0	general
		0x1	pre-escolar (pre-school)
		0x2	Entretenimiento (entertainment)
		0x3	Concurso (contest)
		0x4	Educativo (educational)
		0x5	dibujos animados (cartoons)
		0x6 to 0xF	
0x6	Música (music)	0x0	General
		0x1	Concierto (concert)
		0x2	Directo (live event)
		0x3	Entrevista (interview)
		0x4	Espectáculo (spectacle)
		0x5	Video clip
		0x6	Ballet
		0x7 to 0xF	
0x7	Documental (documentary)	0x0	General
		0x1	Naturaleza (nature)
		0x2	ciencia-tecnología (science-technology)

		0x3	Medicina (medicine)
		0x4	Viajes (trips)
		0x5	Sociológico (sociological)
		0x6	Educativo (educational)
		0x7	Idiomas (languages)
		0x8	Actualidad (current events)
		0x9	Arte (art)
		0xA	Histórico (history)
		0xB	Cultura (culture)
		0xC	Tradiciones (traditions)
		0xD	Comunicación (communication)
		0xE	nuevos medios (new developments)
		0xF	
0x8	Magazine	0x0	general
		0x1	Cine (cinema)
		0x2	Música (music)
		0x3	Toros (bullfighting)
		0x4	Fútbol (soccer)
		0x5	Deportes (sports)
		0x6	Actualidad (current events)
		0x7	Economía (economics)
		0x8	Cultura (culture)
		0x9	Literatura (literature)
		0xA	Moda (fashion)
		0xB to 0xF	
0x9	Televentas (tele-sales)	0x0	general
		0x1 to 0xF	
0xA	Ocio (leisure)	0x0	general
		0x1	Viajes (trips)
		0x2	Artesanía (crafts)
		0x3	Motor (automotive)
		0x4	Salud (health)
		0x5	Cocina (cooking)
		0x6	Compras (purchases)
		0x7	Jardín (garden)
		0x8 to 0xF	
0xB		0x0	general

	Toros (bullfighting)	0x1 to 0xF	
0xC	Serie (series)	0x0	general
		0x1	suspense
		0x2	Acción (action)
		0x3	ciencia-ficción (science-fiction)
		0x4	Comedia (comedy)
		0x5	Drama
		0x6	Romántico (romantic)
		0x7	Histórico (historic)
		0x8	Erótico (erotic)
		0x9	Musical
		0xA	Policíaco (police)
		0xB	Vaqueros (Western)
		0xC	aventuras (adventure)
		0xD	Bélico (war)
		0xE	Infantil (children's)
		0xF	Experimental
0xD	Adulto	0x0	General
		0x1	Hetero
		0x2	Gay
		0x3 to 0xF	
0xE	Religion	0x0	General
		0x1 to 0xF	
0xF		0x0 to 0xF	

- Table 6 provides Australia genre assignments according to Digital television - Requirements for receivers Part 1: VHF/UHF DVB-T television broadcasts, first published as AS 4933.1—2000. Draft - Ver 3 27 August 2001. Note the Australian variation to 5 DVB. Receivers may display, as required, a program's classification/genre type (e.g., genre) as identified by the content_descriptor (Tag value 0x54) found in the EIT. Only the content_nibble_level_1 is currently defined and is as follows. Content_nibble_level_2 and user_nibble are currently not defined.

Table 6 - Australia genre assignments

Content_nibble_level_1 code	Description
-----------------------------	-------------

0x0	Undefined content
0x1	Movie
0x2	News
0x3	Entertainment
0x4	Sport
0x5	Children's
0x6	Music
0x7	Arts/Culture
0x8	Current Affairs
0x9	Education/Information
0xA	Infotainment
0xB	Special
0xC	Comedy
0xD	Drama
0xE	Documentary
0xF	Reserved - not defined

Table 7 provides the UK D-book genre assignments, e.g., the Program Genre Coding, according to Digital Terrestrial Television Version 3:01, last updated 11 February 2001. The coding of Table 7, from d-book: 8.5.2.2 Content (Genre) Coding, identifies the genre or genre of the program (event). It is carried within the content descriptor of the Event Information Table (EIT). The EIT provides program titles and technical data about the planned events on the virtual channels. Each event should be given a maximum of one content description from the UK DTT list in Table 7. Codes are assigned in line with Table 18 in ETS 300 468 (content definition table), and mapped from the DVB service information (SI) table.

Content nibble level 1 only is significant. Content level 2 defines sub-genres or sub-genres. Note that Drama is distinguished from Movies by being assigned a User defined code (0xF0). If there is no content coding in conformance with Table 7 present for an event, the default content description "unclassified" applies. Note that content descriptors from other delivery media may use a different coding method for the content.

Table 7 – UK D-book genre assignments

Content_nibble_leve l_1	DVB Description (for information only)	DTT Description
0x0	Unclassified	Unclassified
0x1	Movie/Drama	Movie
0x2	News/Current affairs	News and Factual

0x3	Show/Game show	Entertainment
0x4	Sports	Sport
0x5	Children 's/Youth programs	Children 's
0x6	Music/Ballet/Dance	Entertainment
0x7	Arts/Culture (without music)	News and Factual
0x8	Social/Political Issues/Economics	News and Factual
0x9	Education/Science/Factual Topics	Education
0xA	Leisure hobbies	Lifestyle
0xB	Special Characteristics	not supported
0xC to 0xE	Reserved for future use	not supported
0xF	user defined	Drama

Table 8 provides Finland Genre Assignments based on Rules of operation of service information in the DTTV network, version 1.3, last updated 12-09-2001. A third column can be defined for Finnish DTTV based on the DVB genre description.

Table 8 – Finland Genre Assignments

Content_nibble_level_1	DVB Description (for information only)
0x0	Unclassified
0x1	Movie/Drama
0x2	News/Current affairs
0x3	Show/Game show
0x4	Sports
0x5	Children's/Youth programs
0x6	Music/Ballet/Dance
0x7	Arts/Culture (without music)
0x8	Social/Political Issues/Economics
0x9	Education/Science/Factual Topics
0xA	Leisure hobbies
0xB	Special Characteristics
0xC to 0xE	Reserved for future use
0xF	user defined

Table 9 provides Sweden genre assignments based on Digital Terrestrial TV Receiver Specification Minimum Technical Requirements for the Swedish Digital Terrestrial Network, Revision 1.0, Date 2002-05-06. The Zapper IRD should handle all nibbles listed in the DVB SI specification (ETSI EN 300 468), but should at least be able to handle the content nibble level1 coding listed in Table 9. If there is no content coding in conformance with the table present for an event, the default content description "unclassified" should be assumed by the receiver.

Table 9 – Sweden genre assignments

Level 1	Description	Translation to be used in S-DTT
0x0	Unclassified	Odefinierat
0x1	Movie	Film
0x2	News / Current Affairs	Nyheter
0x3	Entertainment	Nöje
0x4	Sport	Sport
0x5	Children's / Youth	Barn
0x6	Music	Musik
0x7	Culture (without music)	Kultur
0x8	Social /political Issues/ Economics	Politik
0x9	Education / Science	Utbildning
0xA	Leisure hobbies	Fritid
0xB	Not supported	
0xC - 0xE	Reserved for future use	
0xF	User defined	

Table 10 illustrates a content description behavior specified in 3.3.5 "Long zap

5 banner" and appendix B "Supported themes"- MMI-FRS Zapper & ESG v6.2: (AR6-
920078KD / C6S13, status: approved). E-book content_nibble_1 is made visible through
an icon. Content_nibble_2 is not supported. Content_nibble_1 value 0x0B (Special
characteristics) and 0x0F (User defined) have no icon defined. Differences from the E-
book specification are indicated.

10 A suggested solution for content description is to only support content_nibble_1,
and use a table for nibble 1 per country. This introduces a lot of new strings (supported
countries x 16 x osd languages), but covers everything. The addition of content_nibble_2
introduces numerous strings. Also, we seem to use only content_nibble_1 as an integer
(int) throughout our code.

15 For Spain, the specification is just draft. It is not clear whether they will also
transmit the content_nibble_1. If not, only interpret user_nibble_1 as content_nibble_1.
This will take quite some work, simply to retrieve the user_nibble_1.

The column entitled "missing" denotes that no definition has been provided for the
data indicated in the associated country. The missing "Content_nibble_2" is of no concern
20 for receivers that only interpret "Content_nibble_1".

Table 10

Country:	Missing:
France	Content_nibble_2
Spain	Complete user nibble 1 & 2 interpretation
Portugal	?
Italy	?
Netherlands	?
Australia	Content_nibble_1 interpreted differently
UK	Content_nibble_1 interpreted differently
Norway	Content_nibble_2
Finland	Content_nibble_2
Sweden	Content_nibble_2, however minimum is covered

- Fig. 2 illustrates a method for providing genre assignments, according to the invention. Genre data may be carried in a digital data transmission in the standard content nibbles or user nibbles, in one possible approach. For example, most countries use the standard content nibbles while currently Spain uses the user nibbles. Block 200 states “receive digital transmission.” Thus, a digital television or other digital data transmission is received by a receiver. Block 210 asks “user nibbles defined?” If they are defined, processing continues at block 220, which states “decode user nibbles”. This is done to recover the original genre data for a program. The country associated with the data transmission may also be determined, e.g., based on the term ON1, which is the Original Network Id (original_network_id) from the associated country. Based on the country or other jurisdiction, the corresponding genre assignment schedule or table can be determined.
- If the user nibbles are not defined at block 210, processing continues at block 230, which states “decode standard nibbles.” This is done to recover the original genre data for a program. After processing at blocks 220 or 230, processing continues at block 240, which states “map nibbles to standardized themes/genres.” Here, the nibbles are mapped to genres in the standardized genre assignment schedule, e.g., per Table 2. Note that the receiver can determine from the received transmission whether it needs to interpret the user nibbles or standard content nibbles.

The use of nibbles as discussed to identify and map genres is only one possible implementation. Other implementations will be apparent to those skilled in the art in view

of the teachings herein. Generally, any data that identifies the genre of a program can be interpreted and mapped.

While there has been shown and described what are considered to be preferred embodiments of the invention, it will, of course, be understood that various modifications and changes in form or detail could readily be made without departing from the spirit of the invention. It is therefore intended that the invention not be limited to the exact forms described and illustrated, but should be construed to cover all modifications that may fall within the scope of the appended claims.